

**REMARKS**

Reconsideration of this application is requested. Claims 1-15 are in the case.

**I. THE 35 USC 112, SECOND PARAGRAPH, REJECTION**

Claim 1 stands rejected under 35 USC 112, second paragraph, as allegedly indefinite in light of the term "substantially". That rejection is respectfully traversed.

The expression "substantially free of metallic or metal compound": is defined in the specification at page 2, lines 9-14. Given this definition it is believed that no indefiniteness arises with respect to Claim 1. Withdrawal of the formal rejection is accordingly respectfully requested.

**II. THE OBVIOUSNESS REJECTION**

Claims 1-15 stand rejected under 35 USC 103(a) as allegedly unpatentable over Atkins et al (EP 0757027) in view of Nishino et al and Sato (U.S. 4,465,852). That rejection is respectfully traversed.

The process of the present invention is for the production of lower aliphatic esters. The process comprises reacting a lower olefin with a saturated lower aliphatic mono-carboxylic acid in the vapor phase in the presence of a heteropolyacid catalyst. The reaction is carried out in a plurality of reactors set up in series, and the feedstock is rendered substantially free of metallic or metal compound impurities prior to being brought into contact with the heteropolyacid catalyst.

Claim 1 requires that the feedstock be rendered substantially free of metallic impurities prior to contact with the catalyst. Atkins discloses that the catalyst support preferably has less than 0.3% (3000 ppm) by weight of impurities, but Atkins is completely silent as regards the feedstock purity. Claim 1 is clearly patentably distinguished from Atkins et al on this basis alone.

Sato fails to give rise to a *prima facie* case of obviousness when combined with Atkins. Sato discloses in column 1 that ion-exchange resins may be used as catalysts instead of strong acids or heteropolyacids. This is said to be to overcome problems due to corrosion when strong acids are used, and also difficulties of separation of catalyst and product when liquid catalyst media are used. There is absolutely no mention of removal of impurities: the ion-exchange resins are present to act as catalysts, not purifiers. Moreover, they are disclosed

as being alternatives to heteropolyacids, so there is no disclosure of the two ever being present together in the same system.

The question is whether it would have been obvious to one of ordinary skill, in the light of the cited prior art, to remove impurities from the feedstock prior to contact with the catalyst, in order to improve the performance of the catalyst. Atkins makes no mention of the purity of the feedstock, still less that it contains impurities which could adversely affect catalytic performance. Consequently, the person of ordinary skill reading Atkins is given no suggestion that removal of impurities from the feedstock would be a good thing to do. As for Sato, it is simply irrelevant. Sato adds nothing to the disclosure of Atkins: all that Sato suggests is that strong acid catalysts (not used in the present invention) cause corrosion, and that ion-exchange resins could replace heteropolyacids as catalysts (again not a feature of the present invention).

Nishino discloses reactor construction. Otherwise, Nishino has no relevance to the question of obviousness.

In light of the above, there would have been no motivation for one of ordinary skill to arrive at the present invention based on the cited art, either when taken singly or in combination. Absent any such motivation, it is clear that no

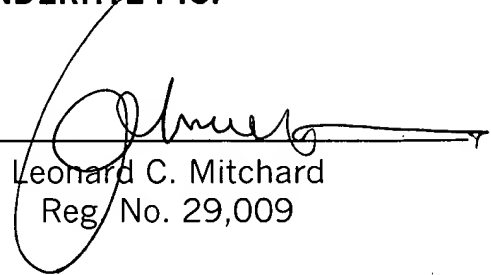
*prima facie* case of obviousness has been made out. Withdrawal of the obviousness rejection is accordingly respectfully requested.

Allowance of the application is awaited.

Respectfully submitted,

**NIXON & VANDERHYE P.C.**

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**VERSION WITH MARKINGS SHOWING CHANGES MADE**

**IN THE CLAIMS**

1. (Amended) A process for the production of lower aliphatic esters which comprises reacting a lower olefin with a saturated lower aliphatic monocarboxylic acid in the vapour phase in the presence of a heteropolyacid catalyst, [characterised in that] wherein a) the reaction is carried out in a plurality of reactors set up in series, and b) the feedstock is rendered substantially free of metallic or metal compound impurities prior to being brought into contact with the heteropolyacid catalyst.